

CLAIMS:

1. A method for vaporizing organic materials onto a surface, to form a film comprising:
 - (a) providing a quantity of organic material in a fluidized powdered form;
 - (b) metering the powdered organic material and directing a stream of such fluidized powder onto a first member;
 - (c) heating the first member so that as the stream of fluidized powder is vaporized;
 - (d) collecting the vaporized organic material in a manifold; and
 - (e) providing a second member formed with at least one aperture in communication with the manifold that permits the vaporized organic material to be directed onto the surface to form a film.
- 10 2. The method according to claim 1 wherein the organic material is provided in a fluidized powdered form by evaporation or rapid expansion of a solution of the organic material in a supercritical solvent.
- 15 3. The method according to claim 1, where the fluidized organic material is metered by a valve at a controlled rate that varies linearly with vaporization rate.
- 20 4. The method according to claim 1, further including providing a deposition chamber and interrupting the vaporization and thereby minimizing contamination of the deposition chamber walls and conserving the organic materials when a substrate is not being coated.
- 25 5. The method according to claim 1, wherein vapor leaves the aperture and is directed onto the surface.
6. The method according to claim 1, wherein the first member and the second member are heated at a constant temperature as the organic material is consumed.
- 30 7. The method according to claim 3, wherein the valve includes a nozzle that is heated.

8. A method for vaporizing organic materials onto a surface, to form a film comprising:

- (a) providing a quantity of organic material in a powdered form into a container;
- 5 (b) fluidizing and metering the powdered organic material and directing a stream of such fluidized powder onto a permeable first member;
- (c) heating the permeable first member so that as the stream of fluidized powder passes through it vaporizes;
- (d) collecting the vaporized organic material in a manifold; and
- 10 (e) providing a second member formed with at least one aperture in communication with the manifold that permits the vaporized organic material to be directed onto the surface to form a film.

9. The method according to claim 8, where the fluidized organic material is metered by a valve at a controlled rate that varies linearly with vaporization rate.

15 10. The method according to claim 8, further including providing a deposition chamber and interrupting the vaporization and thereby minimizing contamination of the deposition chamber walls and conserving the organic materials when a substrate is not being coated.

20 11. The method according to claim 8, wherein vapor leaves the aperture and is directed onto the surface.

12. The method according to claim 8, wherein the permeable first member and the second member are heated at a constant temperature as the organic material is consumed.

25 13. The method according to claim 9, wherein the valve includes a nozzle that is heated.

14. A method for vaporizing organic materials onto a surface, to form a film comprising;

- (a) providing a quantity of organic material in a powdered form into a container;

(b) fluidizing and metering the powdered organic material and directing a stream of such fluidized powder onto a permeable first member;

(c) heating the permeable first member so that as the stream of fluidized powder passes through the permeable first member it vaporizes;

5 (d) collecting the vaporized organic material in a heated manifold; and

(e) providing a second member formed with at least one aperture in communication with the manifold so that the residence time of the vaporized organic material in the manifold is short enough to ensure that there is

10 little or no material degradation and higher vaporization rates are achieved.

15. The method according to claim 14, where the fluidized organic material is metered by a valve at a controlled rate that varies linearly with vaporization rate.

16. The method according to claim 14, further including providing a deposition chamber and interrupting the vaporization and thereby minimizing contamination of the deposition chamber walls and conserving the organic materials when a substrate is not being coated.

17. The method according to claim 14, wherein vapor leaves the aperture and is directed onto the surface.

20 18. The method according to claim 14, wherein the permeable first member and the second member are heated at a constant temperature as the organic material is consumed.

19. The method according to claim 15, wherein the valve includes a nozzle that is heated.

25 20. A device for vaporizing organic materials onto a surface, to form a film comprising:

(a) means for providing organic material in a fluidized powdered form;

(b) a permeable first member;

30 (c) means for metering the fluidized powdered organic material and directing a stream of such fluidized powder onto the permeable first member;

5 (d) means for heating the permeable first member so that as the stream of fluidized powder passes through it vaporizes;

10 (e) a manifold in communication with the vaporized material exiting the permeable first member collecting the vaporized organic material in a manifold; and

15 (f) a second member formed with a plurality of apertures in communication with the manifold that permits the vaporized organic material to be directed onto the surface to form a film.

21. The device according to claim 20 wherein the means for providing organic material in a fluidized powdered form include evaporation or rapid expansion of a solution of the organic material in a supercritical solvent.

22. The device according to claim 20, wherein the fluidizing and directing means includes a valve for metering the vaporized organic material at a controlled rate that varies linearly with vaporization rate.

23. The device according to claim 20, further including a deposition chamber enclosing a substrate and for receiving vaporized organic material and including means for interrupting heating thereby minimizing contamination of the deposition chamber walls and conserving the organic material when a substrate surface is not being coated.

24. The device according to claim 20, wherein vapor leaves the apertures and is directed onto the surface.

25. The device according to claim 20, means for heating the permeable first member and the second member at a constant temperature as the organic material is consumed.

26. The device according to claim 22, wherein the valve includes a heated nozzle.

27. A device for vaporizing organic materials onto a surface, to form a film comprising:

30 (a) container for receiving a quantity of organic material in a powdered form;

(b) a permeable first member;

(c) means for fluidizing and metering the powdered organic material and directing a stream of such fluidized powder onto the permeable first member;

5 (d) means for heating the permeable first member so that as the stream of fluidized powder passes through it vaporizes;

(e) a manifold in communication with the vaporized material exiting the permeable first member collecting the vaporized organic material in a manifold; and

10 (f) a second member formed with a plurality of apertures in communication with the manifold that permits the vaporized organic material to be directed onto the surface to form a film.

28. The device according to claim 27, wherein the fluidizing and directing means includes a valve for metering the vaporized organic material at a controlled rate that varies linearly with vaporization rate.

15 29. The device according to claim 27, further including a deposition chamber enclosing a substrate and for receiving vaporized organic material and including means for interrupting heating thereby minimizing contamination of the deposition chamber walls and conserving the organic material when a substrate surface is not being coated.

20 30. The device according to claim 27, wherein vapor leaves the apertures and is directed onto the surface.

31. The device according to claim 27, means for heating the permeable first member and the second member at a constant temperature as the organic material is consumed.

25 32. The device according to claim 28, wherein the valve includes a heated nozzle.

33. A device for vaporizing organic materials onto a surface, to form a film comprising:

30 (a) container for receiving a quantity of organic material in a powdered form;

(b) a permeable first member;

(c) means for fluidizing and metering the powdered organic material and directing a stream of such fluidized powder onto the permeable first member;

5 (d) means for heating the permeable first member so that as the stream of fluidized powder passes through it vaporizes;

(e) a manifold in communication with the vaporized material exiting the permeable first member collecting the vaporized organic material in a manifold; and

10 (f) a second member formed with at least one aperture in communication with the manifold so that the residence time of the vaporized organic material in the manifold is short enough to ensure that there is little or no material degradation and higher vaporization rates are achieved.

15 34. The device according to claim 33, wherein the fluidizing and directing means includes a valve for metering the vaporized organic material at a controlled rate that varies linearly with vaporization rate.

20 35. The device according to claim 33, further including a deposition chamber enclosing a substrate and for receiving vaporized organic material and including means for interrupting heating thereby minimizing contamination of the deposition chamber walls and conserving the organic material when a substrate surface is not being coated.

36. The device according to claim 33, wherein vapor leaves the aperture and is directed onto the surface.

25 37. The device according to claim 33, means for heating the permeable first member and the second member at a constant temperature as the organic material is consumed.

38. The device according to claim 34, wherein the valve includes a heated nozzle.